Mill Rock Bridge:
Spanning Big Bear Creek
Monmouth Township
Jackson
Iowa

HAER No. IA-7

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

HISTORIC AMERICAN ENGINEERING RECORD
MILL ROCK BRIDGE
(BEAR CREEK BRIDGE)
MONMOUTH TOWNSHIP, JACKSON COUNTY, IOWA
HAER IA-7

Location:	Spanning Big Bear Creek near the corners of sections 21, 22, 27 and 28, Township 84 North, Range 1 East Jackson County, Iowa
UTM:	15/678710 4658730
Quad:	Baldwin, Iowa 1:24,000
Present Owner:	Jackson County, Iowa
Present Use:	Vehicular Bridge
Date of Construction:	1912-1913
Significance:	The Mill Rock Bridge was erected by Clinton Bridge & Iron Works, a major Iowa bridge contractor. It is locally significant as an early instance of the use of riveted connections and concrete deck in county bridge construction. These were among features which were to become standard in subsequent decades due to establishment of the Iowa State Highway Commission and the Commission's enforcement of design standards for various kinds of crossings. Because the Mill Rock Bridge does not display all features associated with this standardization program, it may be considered an illustration of the transition from county to state control of local bridge design and construction.
Project Information:	The Mill Rock Bridge was documented by Dennett, Muessig & Associates, Ltd., Iowa City, Iowa, for the Board of Supervisors and County Engineer, Jackson County, Iowa, in 1983. The project team consisted of J Ceronie, photographer; Martha H. Bowers, historian; and Bruce A. Harms, photographic assistant.

DESCRIPTION

The Mill Rock Bridge spans Big Bear Creek approximately one-half mile south of Baldwin, a small town located on Iowa Highway 64 in southwestern Jackson County, Iowa. Built in 1912-1913, the Mill Rock Bridge is a single span, six-panel symmetrical Pratt through truss structure, with steel superstructure, riveted connections, and concrete floor and abutments. It is approximately 101' long, with a 14'6" roadway and vertical clearance of 14'7".

The top chord and inclined end posts consist of pairs of bar-laced channels with cover plate. The bottom chord is fashioned from paired angles joined at intervals by plates. Vertical compression members are pairs of bar-laced angles. At panels 2 and 5, the diagonal tension members consist of two pairs of angles joined by plates at approximately 2-1/2' intervals. The crossed diagonals of the center panels (3 & 4) feature two angles similarly joined. The top struts are pairs of bar-laced angles riveted to the inner face of the top chord, and strengthened with diagonal braces. Each portal features a lattice of single angles between riveted pairs of angles. Across the top of each portal is a steel plate with dogtooth "cresting," in which the builder's name (Clinton Bridge & Iron Works) and date (1912) have been drilled as a series of small holes. Rods of the top lateral bracing are attached to the cover plate of the top chord.

I-beam floor beams are swung below the riveted bottom chord connections, and are riveted to plates at the base of each vertical post. The deck stringers are also I-beams, with the exception of the two outer stringers, which are channels with flanges oriented inward. The rods which form the bottom lateral bracing are inserted through rectangular holes cut toward each end of each floor beam, then secured with a large nut and washer against a triangular block. The deck is of reinforced concrete, with holes bored through at intervals along the outer edges and in the middle of the roadway for drainage.

HISTORICAL PERSPECTIVE

The historic name "Mill Rock Bridge" derives from the structure's location on Big Bear Creek near the former town of Mill Rock. Mill Rock was platted in 1854, and like many very early Jackson County communities, owed its existence to a flour mill built along the creek by a man named Sloper and later operated by James Craig.[1] The town evidently did not prosper, and by the turn of the century it was considered "little more than a tradition or memory," perhaps due to the ascendancy of Baldwin, a short distance to the north, which was advantageously located on the Iowa Midland Railroad (later Chicago and North Western).[2]

Although it is possible that Big Bear Creek was bridged here in the 19th century, the 1875 Atlas of Iowa suggests that the crossing was located a very short distance south of the present bridge, on a short road leading directly to Main Street in Mill Rock. The first recorded bridge, however, was built in 1910. It was a 50' concrete arch span, probably a variation of the Luten, or Marsh, concrete arch. The bridge, which cost the county $3041, was built with a two-year "guarantee." In August 1912, two months after the guarantee expired, the bridge was washed out. Subsequent investigation indicated that the waterway provided by the 50' arch was "only about half enough." The rising water of Big Bear Creek cut a channel behind the west abutment, and the latter, described as "insufficient" and "shallow" slipped backward, causing the arch to collapse.[3]

On August 29, J. F. McCulloch, an engineer who had recently begun work for Jackson County on a part-time basis, reported that four bridges had been damaged in the recent floods, among them the bridge at Mill Rock. He recommended replacement of all four, the new spans "to be of a truss type of suitable design." He further specified that three of the four be designed for concrete floors, including the bridge at Mill Rock, and that all should have concrete abutments as well.[4]

The Board of Supervisors contracted with John Anderson and Sons, an area firm that did a large share of concrete work in the county, to build the abutments for the new Mill Rock bridge.[5] At the August 29 meeting, the Board had

accepted a "proposition" from the Clinton Bridge and Iron Works to erect all four new superstructures.[6] The informal arrangement, however, was abandoned in March, 1913, in favor of a formal bidding process. Four firms (Monmouth (Ill.) Bridge Co., Omaha Structural Steel, Minneapolis Bridge Co. and Clinton Bridge & Iron Works) submitted proposals. The lowest bid, $5790 for four bridges, submitted by the Clinton firm, was accepted, "providing their specifications, shop drawings and detailed plans...were acceptable to J. F. McCulloch."[7] As far as can be determined, the new span near Mill Rock was completed and open to traffic sometime in mid-1913.

According to the Iowa Department of Transportation, the bridge over Big Bear Creek at Mill Rock represents an early example of riveted high truss bridge construction in Jackson County. The span's riveted connections and concrete deck were features that did not become common in county bridge work until after 1913, when the newly reorganized State Highway Commission was able to enforce standards for culvert and bridge design and construction.[8] Although it has not been confirmed whether or not the Commission provided or reviewed plans for Mill Rock Bridge, the basic features were specified by a qualified engineer, J. F. McCulloch, who although at the time working for Jackson County only part-time, was on May 1, 1913 appointed County Engineer according to state law.[9] It is likely that McCulloch was aware of the Highway Commission's recommendations for bridge design, as evidenced by his specification that the Mill Creek span should be a steel truss with concrete deck. The bridge departs, however, from Commission standards in at least one respect, in that the floor beams are hung below, rather than above, the bottom chord connections. In general, the bridge's partial adherence to Highway Commission standards may be symptomatic of its construction date, which coincided with a period of transition in the history of bridge construction in Jackson County and in the state at large.

FOOTNOTES

1. James W. Ellis. History of Jackson County, Iowa, Chicago: S. J. Clarke, 1910, p. 702; History of Jackson County, Iowa, Chicago: Western Historical Co., 1879, p. 608.

2. Ibid., p. 702.

3. Jackson County Board of Supervisors Minute Book (volume not numbered), Meeting of 11 December 1913, p. 197.

4. Ibid., Meeting of 29 August 1912, p. 74.

5. Ibid., Meeting of 19 December 1912, p. 95.

6. Ibid., Meeting of 29 August 1912, p. 74.

7. Ibid., Meetings of 18 and 19 March 1913, p. 127.

8. Iowa Department of Transportation. "Bridge Site Over Bear Creek, Jackson County, Iowa, BRS-4982(3)," (August 1982), pp. 21-22.

9. Jackson County Board of Supervisors Minute Book (volume not numbered), Meeting of 1 May 1913, p. 135.

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